

PENALTIES AND PUBLIC EDUCATION CAMPAIGNS:
AN ANALYSIS OF U.S. STATES' POLICY EFFORTS TO PREVENT
CELL PHONE RELATED DISTRACTED DRIVING FATALITIES

by
Leonard Bellisario

A capstone project submitted to Johns Hopkins University in conformity with the
requirements for the degree of Master of Science in Government Analytics

Baltimore, Maryland
May 2018

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Abstract

Existing literature on U.S. states' policy efforts to prevent cell phone related distracted driving fatalities currently lacks a comprehensive quantitative analysis on the effects of penalty severity and public education campaigns. This article contributes to the existing research by using Fatality Analysis Reporting System (FARS) data from the U.S. National Highway Traffic Safety Administration and Poisson regression models to measure the effect of penalty severity and state public education efforts on cell phone related distracted driving fatality rates. The results indicate the following policies as being associated with statistically significant reductions in fatalities: higher penalties for texting while driving, public education campaigns that utilize social media, campaign taglines and state agency partnerships such as those with universities to conduct research and employers to develop distracted driving policies. These results can inform policymakers in both state legislatures and agencies that are interested in combating cell phone related distracted driving fatality rates.

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1. Introduction

Distracted driving is a highly prolific and dangerous behavior that claims thousands of lives every year in the United States.¹ While there are many activities that can divert the attention away from the driver of a motor vehicle, including eating, drinking and operating an entertainment system, cell phone usage is often considered to be one of the most dangerous forms of distracted driving. The Centers for Disease Control and Prevention reports that nearly one-third of all U.S. drivers aged 18 to 64 read or send text or email messages while behind the wheel.² A driver taking their eyes off the road for only five seconds to read or send a text message can result in the equivalent of driving the length of an entire football field with their eyes closed.³

The issue of cell phone related distracted driving has attracted the interest of policymakers at both the federal and state levels. Recently, U.S. House Subcommittee on Digital Commerce and Consumer Protection Chairman Greg Walden expressed his concerns with the problem of distracted driving and explained that 94 percent of traffic-related crashes are due to human error.⁴ Nearly every state and the District of Columbia have implemented policies in response to this public health problem. Generally, there are two major policy approaches to addressing cell phone related distracted driving. The first approach is to pass laws that prohibit drivers from using handheld cell phones while

¹ “Distracted Driving.” National Highway Traffic Safety Administration. <https://www.nhtsa.gov/risky-driving/distracted-driving>. (February 7, 2018)

² Centers for Disease Control and Prevention. “Mobile Device Use While Driving – United States and Seven European Countries.” *Morbidity and Mortality Weekly Report*. (2011)

³ “Distracted Driving.” NHTSA. (February 7, 2018)

⁴ “Opening Statement of Chairman Greg Walden Subcommittee on Digital Commerce and Consumer Protection Hearing on “Oversight of the National Highway Traffic Safety Administration.” U.S. House Energy and Commerce Committee. <http://docs.house.gov/meetings/IF/IF17/20180214/106854/HHRG-115-IF17-MState-W000791-20180214.pdf>. (February 8, 2018)

behind the wheel. There are differences in these state laws in terms of prohibited behavior. For example, some states have passed laws that prohibit all drivers from using handheld cell phones while driving. Almost every state has outlawed sending text messages while operating a motor vehicle. The penalties for violating these laws vary from state to state. The second approach is to launch public information campaigns that are designed to educate the public about the dangers of this behavior. As with the prohibition laws, the public education efforts among the states are quite diverse. On one hand, states such as Kentucky have been very aggressive in educating motorists about distracted driving. The state has used both Facebook and Twitter to share the U.S. National Highway Traffic Safety Administration's (NHTSA) message about distracted driving and to promote the federal [Distraction.gov](http://www.distraction.gov) website and built a website with resources such a distracted driving simulator video, a no texting pledge and distracted driving tip sheet. Kentucky has also created a series of videos with a local distracted driving crash survivor. On the other hand, there are states such as Maine that have also taken steps to educate the public about the dangers of distracted driving but have not developed a campaign message/tagline and have not utilized social media to reach citizens.

This article contributes to the literature by conducting a statistical analysis of the effectiveness of states' policies to prevent cell phone distracted driving traffic fatalities which considers penalty severity for violating a distracted driving law and various public education efforts of the dangers of this behavior. The results of the Poisson regression models show that the most successful aspects of states' policies include: using social media as part of a public education campaign, having a penalty for a first violation that is

greater than \$100, a state using a campaign tagline as part of its public education efforts, having a penalty for a third or subsequent violation that is greater than \$200, work with universities to conduct research and state agencies working with employers to develop distracted driving policies. The implementation of these policies showed a statistically significant reduction in the number of cell phone related distracted driving fatalities.

The following section reviews the existing literature to date on the topic of states' policies to prevent cell phone related distract driving fatalities and provides a theoretical framework for the paper's research question and argument. The third section describes the data used and methodological choices made to conduct the analysis. The fourth section presents the findings of the research. The article concludes with a summary of the main arguments and key findings, relevant policy implications, a discussion of limitations of the research and explores opportunities for future research.

2. Literature Review & Theoretical Framework

2.1 Distracted Driving

The first mobile phones have been available since the early 1970s. The development of smartphones in the mid-2000s has brought cell phone usage in the United States now to an all-time high. Recent surveys have found that cell phone ownership among adults has exceeded 90 percent.⁵ Studies have shown that the increased accessibility of this technology has led to a proliferation of distracted driving. In 2005, the NHTSA estimated that at any given time of the day there were 974,000 vehicles on

⁵ Raine, Lee. "Cell Phone Ownership Hits 91% of Adults." Pew Research Center. <http://www.pewresearch.org/fact-tank/2013/06/06/cell-phone-ownership-hits-91-of-adults/>. (February 7, 2018)

the road being driven by someone using a handheld phone (Harding, 2012).⁶ This phenomenon has resulted in high levels of traffic fatalities. An examination of the Fatality Analysis Reporting System (FARS) data on all road fatalities found that after declining from 1999 to 2005, fatalities from distracted driving increased 28% after 2005, rising from 4,572 fatalities to 5,870 in 2008 (Wilson and Stimpson, 2011).⁷ The association between cell phone use and vehicle crashes is well documented. A review of over 120 studies revealed that cell phone use while driving was associated with impaired reaction time and increased crash risk (McCartt et al. 2006).⁸

2.2 State Bans on Handheld Cell Phones

In 2001, as a response to accident trends, New York became the first state to enact a law banning handheld cell phones while driving. As of this writing, 14 states and the District of Columbia have passed laws that prohibit all drivers from using handheld cell phones while driving.⁹ There has been interest in studying the effectiveness of these state laws from both the health¹⁰ and transportation¹¹ policy perspectives.

Several researchers have questioned the constitutionality of such bans (Lazerow, 2010). Others have written that driving is a privilege, not a right and therefore distracted

⁶ Harding, Cody J. "The Failure of State Texting-While-Driving Laws." *Pittsburgh Journal of Technology Law & Policy* 13 (2012): i.

⁷ Wilson, Fernando A., and Jim P. Stimpson. "Trends in Fatalities From Distracted Driving in the United States, 1999 to 2008." *American Journal of Public Health* 100, no. 11 (2010): 2213-2219.

⁸ McCartt, Anne T., Laurie A. Hellinga, and Keli A. Bratiman. "Cell Phones and Driving: Review of Research." *Traffic Injury Prevention* 7, no. 2 (2006): 89-106.

⁹ "State Laws on Distracted Driving - Ban on Hand-Held Devices and Texting While Driving." U.S. Department of Transportation. <https://www.bts.gov/content/state-laws-distracted-driving-ban-hand-held-devices-and-texting-while-driving>. (February 10, 2018)

¹⁰ Ibrahim, Jennifer K., Evan D. Anderson, Scott C. Burris, and Alexander C. Wagenaar. "State Laws Restricting Driver Use of Mobile Communications Devices: Distracted-Driving Provisions, 1992-2010." *American Journal of Preventive Medicine* 40, no. 6 (2011): 659-665.

¹¹ Lim, Siew Hoon, and Junwook Chi. "Are Cell Phone Laws in the US Effective in Reducing Fatal Crashes Involving Young Drivers?" *Transport Policy* 27 (2013): 158-163.

drivers have a limited expectation of privacy that is relinquished to the government's interest in improving roadway safety. Additionally, courts have consistently upheld mandates on other driving safety requirements such as seat belt laws and rules for motorcycle helmets (Jacobson and Gostin, 2010).¹²

There have been numerous articles examining the effectiveness of all-driver handheld cell phone bans in individual states. A study was conducted on the long-term effects on driver handheld phone use in the District of Columbia, New York and Connecticut (McCartt et al. 2010). It was found that in all three jurisdictions, the chance that a violator would receive a citation was low and there were no publicized targeted enforcement campaigns at the time of the study. However, the authors did conclude such bans have reduced handheld phone use while driving and appear capable of maintaining reductions for the long term.¹³ Additionally, O.H. Kwon et al. (2014) analyzed the six-year collision data between 2005 and 2010 in the state of California to examine the timing of a significant trend of cellphone related collisions and suggest that the law is one of the primary factors in the reduction of cellphone related collisions.¹⁴

A recent meta-analysis of 11 peer-reviewed papers and technical reports of all-driver handheld phone bans and texting bans was conducted with varied results. McCartt et al. (2014) examined crash measures before and after a state ban, other national or

¹² Jacobson, Peter D., and Lawrence O. Gostin. "Reducing Distracted Driving: Regulation and Education to Avert Traffic Injuries and Fatalities." *Journal of the American Medical Association* 303, no. 14 (2010): 1419-1420.

¹³ McCartt, Anne T., Laurie A. Hellinga, Laura M. Strouse, and Charles M. Farmer. "Long-Term Effects of Handheld Cell Phone laws on Driver Handheld Cell Phone Use." *Traffic Injury Prevention* 11, no. 2 (2010): 133-141.

¹⁴ Kwon, Oh Hoon, Yoonjin Yoon, and Kitae Jang. "Evaluating the Effectiveness of the Law Banning Handheld Cellphone Use While Driving." *Safety Science* 70 (2014): 50-57.

multi-state studies which compared crashes in states with and without bans over time.

The authors suggest it is unclear whether the laws are having the desired effects on safety due to a lack of appropriate controls and other challenges in conducting strong evaluations which limited the findings of some of the studies.¹⁵

2.3 State Bans on Texting While Driving

As of this writing, 46 states and the District of Columbia have passed laws that prohibit all drivers from sending text messages while driving.¹⁶ There is research that points to overwhelming public support for such laws (Chase, 2014).¹⁷ Rocco and Sampaio (2016) evaluated whether texting and handheld cell phone bans were effective in reducing the number of fatalities occurring in motor vehicles crashes using U.S. county-level data. While the authors found that all states experienced a reduction in fatalities, some states were highly affected while others were only affected in a small scale. States, such as California and the District of Columbia, that enacted primary cell phone bans – where an officer may cite a driver for using a handheld cell phone without any other traffic offense taking place – experienced a significant reduction in the number of fatalities. Whereas states such as Utah and Washington, both under bans with secondary enforcement, showed the smallest effect of bans on fatalities.¹⁸

¹⁵ McCartt, Anne T., David G. Kidd, and Eric R. Teoh. "Driver Cellphone and Texting Bans in the United States: Evidence of Effectiveness." *Annals of Advances in Automotive Medicine* 58 (2014): 99.

¹⁶ "State Laws on Distracted Driving - Ban on Hand-Held Devices and Texting While Driving." U.S. Department of Transportation. (February 10, 2018)

¹⁷ Chase, JD Catherine. "US State and Federal Laws Targeting Distracted Driving." *Annals of Advances in Automotive Medicine* 58 (2014): 84.

¹⁸ Rocco, Leandro, and Breno Sampaio. "Are Handheld Cell Phone and Texting Bans Really Effective in Reducing Fatalities?" *Empirical Economics* 51, no. 2 (2016): 853-876.

Continuing, there is a significant body of research which calls into question the effectiveness of texting while driving bans. The laws have been shown to be unsuccessful when considering prosecution limits, inconsistent enforcement and the public's willingness to violate them (Harding, 2012)¹⁹. Additionally, Abouk and Adams (2013) found that the effectiveness of bans on texting while driving appear moderately successful at reducing single-vehicle, single-occupant accidents if the bans are universally applied to all drivers regardless of their age and enforced as a primary offense. However, bans enforced as secondary offenses appear to have no effect on accidents. In either case, the researchers concluded that any reduction in vehicle accidents as a result of texting bans is short-lived and within a few months, accident levels return to their former levels prior to the enactment of the legislation. This is suggestive that the drivers in the state may simply be reacting to the announcement of the legislation but ultimately return to their old habits shortly afterwards.²⁰

Finally, there is research showing that the effectiveness of such bans is dependent on driver density levels. Jacobson et al. (2012) suggests that bans on handheld wireless devices while driving reduces the rate of personal injury accidents in counties with high levels of driver density but may actually increase accident rates in counties with low driver density levels.²¹ The authors explain that similar results have been found in analyses by the Insurance Institute for Highway Safety (IIHS) and cite these findings for

¹⁹ Harding, Cody J. (2012)

²⁰ Abouk, Rahi, and Scott Adams. "Texting Bans and Fatal Accidents on Roadways: Do They Work? Or Do Drivers Just React to Announcements of Bans?" *American Economic Journal: Applied Economics* 5, no. 2 (2013): 179-99.

²¹ Jacobson, Sheldon H., Douglas M. King, Kevin C. Ryan, and Matthew J. Robbins. "Assessing the Long Term Benefit of Banning the Use of Hand-Held Wireless Devices While Driving." *Transportation Research Part A: Policy and Practice* 46, no. 10 (2012): 1586-1593.

a possible expiation of their results. The organization reports that an unexpected consequence of banning texting while driving laws is the immediate response of drivers to hide their phones from view, perhaps in the hope of avoiding penalties. This action results in the driver taking their eyes off the road more than they would have prior to the ban, thus increasing the threat of the behavior.²²

Many of the previously cited studies examining the effectiveness of distracted driving state laws included a variety of variables such as whether a state law has primary or secondary enforcement and specifics of the laws including whether the state has implemented a handheld ban or a texting ban, etc.²³ Other scholarship has considered variables outside of the laws themselves. Rocco and Sampaio (2016) considered variables such as the price of gas and the unemployment level in a state.²⁴ Additionally, there is research examining the effectiveness of state cell phone laws in reducing non-alcohol related fatal crashes involving drivers under the age of 21, which considers per capita income and per capita beer consumption.²⁵

2.4 Public Education Campaigns

In addition to passing laws penalizing cell phone related distracted driving, many states have taken steps to educate the public about the dangers of this behavior.²⁶ Public education campaigns have long been used as a means to achieve desired policy outcomes.

²² Insurance Institute for Highway Safety. "Texting Laws and Collision Claim Frequencies." *Highway Loss Data Institute Bulletin* Vol. 27, No. 11 (2010)

²³ Cheng, Cheng. "The Effect of Cell Phone Bans on Driver Behavior: Accidents and Casualties." *College Station, TX: Department of Economics, Texas A&M University* (2012).

²⁴ Rocco, Leandro, and Breno Sampaio. (2016)

²⁵ Lim, Siew Hoon, and Junwook Chi. (2013)

²⁶ "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2016-12/2013_distraction.pdf. (February 5, 2018)

Prominent examples of such campaigns include government efforts to encourage citizens to prevent forest fires, eat healthy food, quit smoking and recycle. There is no shortage of literature on the effectiveness of these types of campaigns. Research examining the role of information provision as a policy instrument to supplement environmental taxation on certain products has found that the combination of the two instruments enhance efficiency of the policy objective (Sartzetakis et al. 2012).²⁷ The results of this study are particularly relevant for this article because many states both implement penalties for distracted driving as well as have a public information campaign.

In their landmark paper, Weis and Tschirhart (1994) analyzed the use of campaigns as policy instruments in three ways: effectiveness in achieving substantial outcomes, political benefits for public officials and consequences for the democratic process. Their meta-analysis of 100 campaigns from these three perspectives reveals significant advantages and disadvantages of using public information campaigns (PICs) in practice. The authors explain that PICs can be quite effective when they capture the attention of the right audience, deliver an understandable and credible message that influences the beliefs or understanding of the audience and create social contexts that lead towards desired outcomes. Politicians benefit from the use of PICs because it is often less politically painful to frame problems by blaming individuals as opposed to powerful interest groups. PICs also provide lawmakers with the ability to target specific groups and they appreciate that PICs are often cheaper than alternative policy instruments. Finally, PICs have an effect on the relationship between citizens and

²⁷ Sartzetakis, Eftichios S., Anastasios Xepapadeas, and Emmanuel Petrakis. "The Role of Information Provision as a Policy Instrument to Supplement Environmental Taxes." *Environmental and Resource Economics* 52, no. 3 (2012): 347-368.

government. The use of PICs is associated with threats to democratic values because they may weaken or distort the competition of ideas in a free and open marketplace or restrict the role of citizens by closing off opportunities for individual choice. The authors explain the importance of safeguards against the negative consequences of PICs and strengthening their positive consequences. Ultimately, they conclude that the advantages of public information campaigns justify their use as policy instruments when used appropriately and when care is exercised to lessen the disadvantages.²⁸

An example of a well-known traffic safety PIC is *Click It or Ticket*, which is a NHTSA campaign administered through the states and aimed at increasing the use of seat belts among young people. An analysis of the first years of program mobilizations in the states found that when high-visibility seat belt enforcement mobilizations were in operation in the United States, belt use increased nationwide and in virtually all states.²⁹ Evaluating an individual state, a separate study found that after Hawaii increased enforcement and publicity of the program, the state saw an immediately increase in safety belt use. While this effect dropped-off in the months following the launch of the campaign, safety belt use stabilized at higher levels than prior to the start of the campaign.³⁰

²⁸ Weiss, Janet A., and Mary Tschirhart. "Public Information Campaigns as Policy Instruments." *Journal of Policy Analysis and Management* 13, no. 1 (1994): 82-119.

²⁹ Tison, Julie, Allan F. Williams. "Analyzing the first years of the click it or ticket mobilizations - No. DOT HS 811 232." U.S. National Highway Traffic Safety Administration. <https://www.ems.gov/pdf/811232.pdf>. (February 10, 2018)

³⁰ Kim, Karl, and Eric Yamashita. "Click It or Ticket: Boosting Seat Belt Use in Hawaii." *Highway Safety, Traffic Law Enforcement*. (2003)

2.5 Current Gaps in Literature

While public policy efforts to prevent distracted driving fatalities has received significant attention in the literature, there are gaps that remain. To the best of this author's knowledge, there is no existing research measuring the effectiveness and variation of public policy efforts across states to prevent distracted driving traffic fatalities which considers penalty severity for violating a texting while driving law and public education efforts of the dangers of this behavior. First, there are important differences among state distracted driving laws regarding violation penalties. For example, in California, texting while driving fines are \$20 for a first offense and \$50 for each subsequent offense.³¹ Whereas in Oregon, the fine for a first offense ranges from \$130 to \$1,000. Penalties for a second offense range from \$220 to \$2,500. These penalties may also apply to a first offense if it contributed to a crash. A third offense for texting while driving is a minimum fine of \$2,000 with a maximum fine of \$6,250 and the possibility of spending six months in jail.³² These are important differences that should be accounted for in a model that is analyzing the effectiveness of texting and driving laws.

Similar to differences in violation penalties, there are variations in state public information campaign activities. Some state governments have developed distracted driving awareness campaigns with unique messages and taglines. This often includes the use of social media and agency websites to communicate this information. Some states

³¹ "Vehicle Code Section 23124." California Legislative Information.
https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH§ionNum=23124.
(February 10, 2018)

³² "Oregon House Bill 2597 – Distracted Driving Fact Sheet." Oregon Department of Transportation.
http://www.oregon.gov/odot/safety/documents/hb2597_summary_for_public.pdf. (February 10, 2018)

are very aggressive with their outreach efforts, while others have largely relied on criminal penalties as a means for addressing this issue. Currently, no existing scholarship considers these variables as part of their models. These are important policy differences that should be examined. Distracted driving is not only a public health threat, but states are already dedicating substantial resources towards enacting, enforcing, and educating the public on these distracted driving laws. In an era of ever shrinking budgets, it is essential that policymakers have the knowledge of which policies are having the greatest impact on improving vehicular safety and understanding their options for replicating other states' successes. This literature seeks to fill this important gap.

3. Data and Methods

3.1 Overview of Variables

The variables in this dataset can be organized into three categories: state-level cell phone related distracted driving fatalities, laws banning distracted driving and public education efforts of state government efforts to combat this behavior. The variable descriptions are displayed in Table 1. The dependent variable in this paper's models is the number of vehicle fatalities in a state in a year caused by distracted driving related to cell phone usage. More specifically, the data source defines a distracted driving fatality as one where the driver was distracted by either: talking or listening to a cellular phone, manipulating a cellular phone or another type of cellular phone related distraction. There is also a variable for the total number of cell phone related distracted driving fatalities for every year in a state.

Table 1: Description of Variables

<i>State</i>	State
<i>Year</i>	Year
<i>TalkingListeningCellPhone</i>	Distracted driving fatalities while talking/listening to a cell phone
<i>ManipulatingCellPhone</i>	Distracted driving fatalities while manipulating a cell phone
<i>OtherCellPhone</i>	Other cell phone related distracted driving fatalities
<i>TotalFatalities</i>	Total cell phone related distracted driving fatalities
<i>Population</i>	State population
<i>Fatalitiesper100000</i>	Cell phone related distracted driving fatalities per 100,000 population
<i>AllDriverTextingBan</i>	=1 if all driver texting ban, 0 otherwise
<i>TextingBanPenaltyFirstOffense</i>	=1 if penalty for first violation of a texting ban is >\$100, 0 otherwise
<i>TextingBanPenaltySecondOffense</i>	=1 if penalty for second violation of a texting ban is >\$150, 0 otherwise
<i>TextingBanPenaltyThirdOffense</i>	=1 if penalty for third/subsequent violation of a texting ban >\$200, 0 otherwise
<i>PrimaryEnforcement</i>	=1 if primary enforcement on all driver texting ban, 0 otherwise
<i>PublicEducation2010</i>	=1 if taken steps to educate the public on distracted driving 2010, 0 otherwise
<i>PublicEducation2012</i>	=1 if taken steps to educate the public on distracted driving 2012, 0 otherwise
<i>CampaignTagline</i>	=1 if developed a distracted driving campaign tagline, 0 otherwise
<i>SocialMedia2010</i>	=1 if using social media to educate motorists in 2010, 0 otherwise
<i>SocialMedia2012</i>	=1 if using social media to educate motorists in 2012, 0 otherwise
<i>EmployerCollaoration</i>	=1 if worked with employers to develop distracted driving policies, 0 otherwise
<i>UniversityResearch</i>	=1 if partnered with universities to conduct research, 0 otherwise
<i>OtherPartnerships2010</i>	=1 if worked with other state agencies and/or organizations in 2010, 0 otherwise
<i>OtherPartnerships2012</i>	=1 if worked with other state agencies and/or organizations in 2012, 0 otherwise

There are 357 observations of vehicle fatalities in a state from the years 2010 – 2016. Not every state has a recorded vehicular fatality related to cell phone activity in every year. The dependent variable was constructed as a rate because of the variation in state population size: $Total\ Fatalities/Population*100,000 = Fatalities\ per\ 100,000\ Population$

3.2 Sources

The source for the dependent variable is the Fatality Analysis Reporting System (FARS) which contains data on all vehicle crashes in all 50 states and the District of Columbia that occur on a public roadway and involve a fatality. FARS was created by the U.S. National Highway Traffic Safety Administration (NHTSA) to provide an overall measure of highway safety and to serve as a quantitative source to evaluate the effectiveness of motor vehicle safety standards and highway safety programs. More specifically, cell phone related distracted driving fatalities in all 50 states and DC from the years 2010 – 2016 were analyzed, as these are all the years with available data.

Several sources were used for the independent variables. First, a dataset of the states' texting while driving ban laws was compiled for this paper. The sources for this information include the Insurance Institute for Highway Safety (IIHS), the Governors Highway Safety Association (GHSA), the National Council of State Legislatures and each state law that is purported to exist was retrieved from the respective state's legislative archives. The dataset was constructed as panel data. The years in a state prior to enactment of a texting ban law was coded as 0 and then 1 in the first year the law was implemented and afterwards. Details collected about each state law include: its enactment year, penalties for first, second and third/subsequent offense and whether officers have primary or secondary enforcement of the law.

Second, the *2013 Distracted Driving: Survey of the States* report published by the GHSA was referenced to measure state public education efforts on distracted driving. This report provides information about states' activities to educate the public about the dangers of distracted driving. GHSA is a nonprofit representing the state highway safety offices (SHOs) that implement federal grant programs to address behavioral highway safety issues. In late 2012, GHSA surveyed its SHO members to determine the extent to which they were pursuing activities to address distracted driving. The answers to the survey questions (Table 2) regarding public education campaigns were coded as dummy variables. A yes answer was coded as a 1 and an otherwise response was coded as a zero. Some state governments have developed a distracted driving campaign with unique messages and taglines. These campaigns often includes the use of social media and agency websites to communicate this information. Some states are very aggressive with their outreach efforts, while others have largely relied on criminal penalties as a means

for addressing this problem. Finally, state population data was gathered from the Insurance Institute for Highway Safety – Highway Loss Data Institute.

Table 2: Public Education Campaign Survey Questions

Has your state taken steps to educate the public about the dangers of distracted driving? (2010 and 2012)
Has your state developed a distracted driving campaign message/tagline?
Is your state using new media/social networking sites to educate motorists about distracted driving? (2010 and 2012)
Has your state worked with employers to help them develop workforce distracted driving policies?
Has your state highway safety office funded or partnered with any colleges/universities to conduct research on distracted driving?
Has your state worked with other state agencies and/or private organizations to address the issue of distracted driving?

Source: Governors Highway Safety Association “2013 Distracted Driving: Survey of the States”

3.3. *Methods*

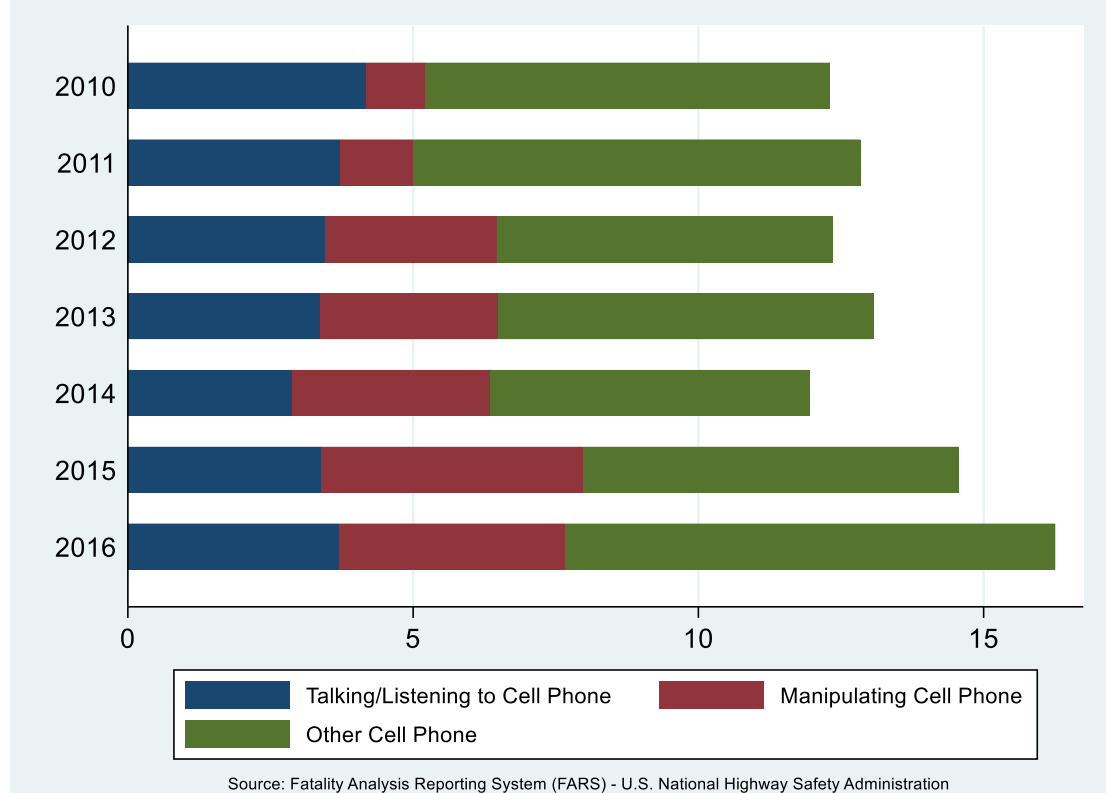
All the models presented in the preceding sections are Poisson regression models. This generalized linear model form of regression analysis was selected over ordinary least squares regression (OLS) for several reasons. Poisson regression models are appropriate for data that represents counts or rates. In this case, the dependent variable is the rate of cell phone related distracted driving fatalities in a year. The Poisson distribution is ideal for modeling the number of times an event occurs in an interval of time. Additionally, because OLS regression uses the normal distribution as its probability model, it is not a good fit for this type of data because many states in the dataset did not have any cell phone related distracted driving fatalities in every year. It is important to note that all the years are pooled in the dataset for these models and therefore, robust standard errors are used.

4. Results

4.1 Overview

Figure 1 displays the average annual cell phone related distracted driving fatalities by category among the states. These results show that there is an overall country-wide increase in the number of cell phone related distracted driving fatalities.

Figure 1: States' Average Cell Phone Related Distracted Driving Fatalities by Type (2010 – 2016)

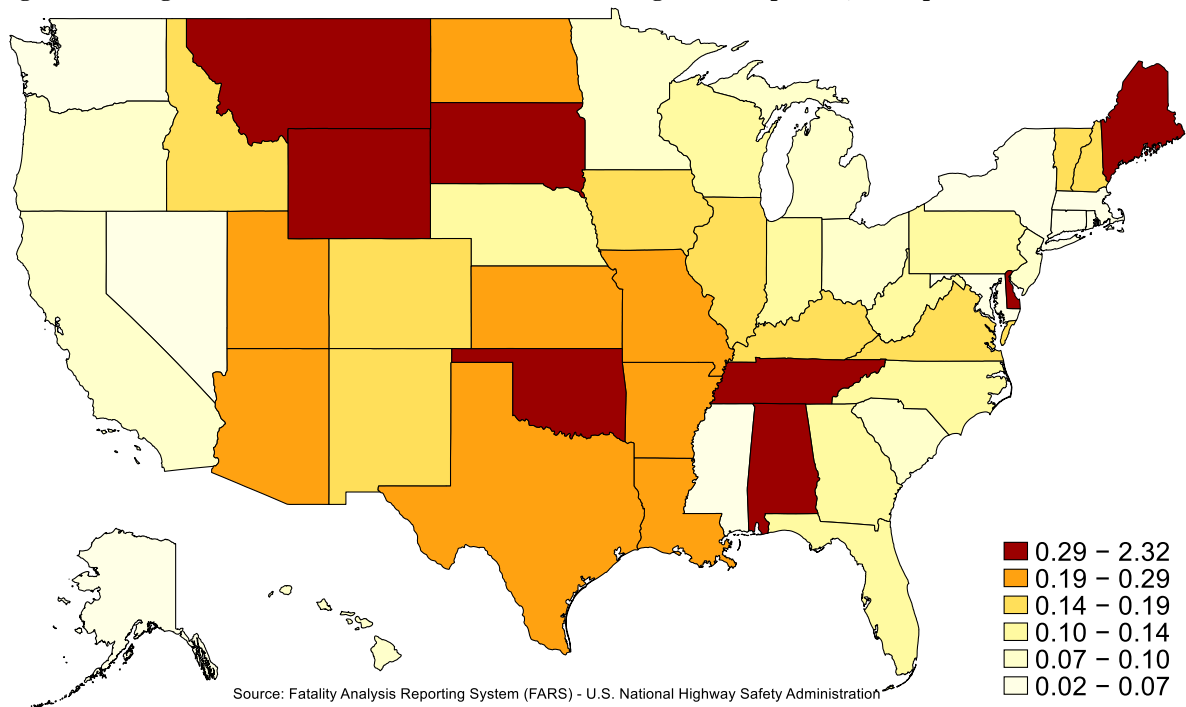


The category of manipulating a cell phone shows the largest increase over the years, whereas talking or listening generally decreases. A possible explanation for this trend is the proliferation of smartphones and different social media and text message apps such as Facebook Messenger and WhatsApp and fewer calls are being placed. According to the International Smartphone Mobility Report by the mobile data tracking firm

Infomate, American smartphone users are sending and receiving five times as many texts compared with the number of phone calls each day.³³

Figure 2 displays the average annual rate of all cell phone related distracted driving fatalities in each state for the years 2010 – 2016. There are several insights that can be taken from this graphic. First, each of the four U.S. Census Bureau-designated regions (Midwest, Northeast, South and West) has at least one of the eight states (AL, DE, MT, ME, OK, SD, TN and WY) that fall within the highest range of fatality rates. Additionally, there are several divisions, including Division VIII (CO, MT, ND, SD UT and WY) and Division VI (AR, LA, NM, OK and TX) that have large concentrations of states with the highest fatality rates.³⁴

Figure 2: Average Annual Cell Phone Related Distracted Driving Fatalities per 100,000 Population (2010 – 2016)



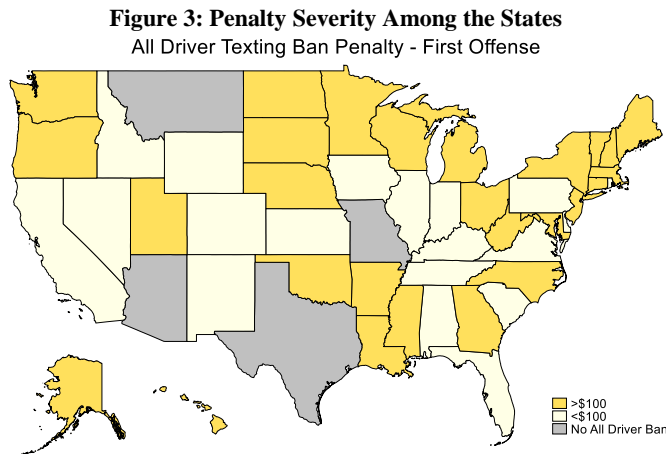
³³ Shropshire, Corilyn. “Americans prefer texting to talking, report says.” *Chicago Tribune*. <http://www.chicagotribune.com/business/ct-americans-texting-00327-biz-20150326-story.html>. (March 5, 2018)

³⁴ “Census Regions and Divisions of the United States.” U.S. Census Bureau. https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf. (March 28, 2018)

The effect of geography on cell phone related distracted driving fatalities is beyond the scope of this paper. However, this suggests that the problem of cell phone related distracted driving fatalities is not limited to a few isolated areas but rather occurring in states all throughout the country.

The tables presented in this paper report the results of the Poisson regression models analyzing the various specifics among the state policies addressing cell phone related distracted driving. Models 1 – 3 measure the effect of state texting while driving ban laws. Models 4 – 6 indicate the degree to which public education effort are successful at reducing fatalities. Continuing, Models 7 – 9 measure the effect of public-private partnerships as part of these campaign efforts. Finally, Model 10 combines the aspects of the laws and public education campaigns in a single model.

4.2 Texting While Driving Ban Laws



the primary enforcement aspect of the law is associated with a slight increase in fatalities. A likely explanation for this phenomenon has been discovered by the IIHS. As previously mentioned, the organization has reported that in response to texting while driving laws, drivers may often hide their phones from view to avoid detection as they desire to avoid facing penalties.³⁵ When the state law includes a primary enforcement mechanism, a driver who wanted to text while behind the wheel would possibly have further incentive to be more discreet with their behavior and thus behave in a more dangerous way.

Nearly every state law has three penalty levels included within the statute: first violation, second violation and third/subsequent violations. However, a major difference among these state laws is the penalty severity for violation. An approximate average of each violation level was taken and states were categorized as having a fine that is either above or below the average penalty. When a state law only gives a range for a penalty amount, the average amount was taken. These amounts did not take into account administrative court fees. Figure 3 displays the differences in penalty severity among the three levels throughout the states. The majority of the states (27 plus the District of Columbia) have penalties that are greater than \$100 for a first time violation. However, only 21 states have penalties greater than \$150 for a second offense and even fewer (18) have penalties greater than the national average of \$200 for a third/subsequent violation. The results of Model 3 suggest that having a penalty for a first violation greater than \$100 and a penalty for a third/subsequent violation greater than \$200 leads to statistically significant reductions in cell phone related distracted driving fatalities. Having higher

³⁵ Insurance Institute for Highway Safety. "Texting Laws and Collision Claim Frequencies." (2010)

penalties may serve as deterrents to drivers who may otherwise text while behind the wheel.

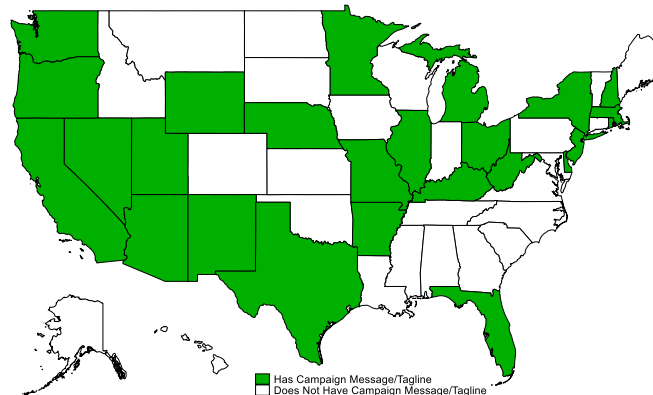
Table 3: The Effect of State Texting While Driving Ban Laws on Cell Phone Related Distracted Driving Fatalities

VARIABLES	(Model 1) Texting While Driving Ban	(Model 2) Primary Enforcement	(Model 3) Penalty Severity
All Driver Texting Ban	-0.25229 (0.17368)		
Primary Enforcement		0.44979** (0.18788)	0.51073** (0.20067)
First Violation Penalty ≥ 100			-0.83923*** (0.15665)
Second Violation Penalty ≥ 150			0.13594 (0.17312)
Third/Subsequent Violation Penalty ≥ 200			-0.46453*** (0.16250)
Constant	-1.30358*** (0.13970)	-1.97285*** (0.15299)	-1.53235*** (0.18028)
Observations	357	303	303

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Public Education Campaigns

Figure 4: State Developed Distracted Driving Campaign Message/Tagline



In Table 4, Models 4 and 5 measure the effect of a state having a public education campaign and using social media to address distracted driving in 2010 and 2012, respectively. In both years, a state reporting efforts to educate the public on this dangerous behavior does not result in a statistically significant decrease in fatalities. In 2010, including the use of social media also fails to deliver significant results. However, the use of social media in 2012 is associated with a statistically significant .85 fatalities

per 100,000 population decrease in cell phone related distracted driving fatalities. There are several possible explanations for this result. First, there was a dramatic 125 percent increase in the number of states from 2010 to 2012 that are employing social media communication strategies.³⁶ A second possible explanation is the continued increase in social media use among American adults. According to the Pew Research Center, 46 percent of all American adults used at least one social networking site in 2010. That figure jumped to 55 percent by the year 2012.³⁷ Having more adult social media users could lead to higher exposure levels to the state public information campaigns.

Model 6 shows the effectiveness of educating the public on the dangers of distracted driving when including a campaign message and/or tagline. Having a consistent catchphrase as a part of a state's public education efforts is associated with a statistically significant .55 fatalities per 100,000 population decrease in cell phone related distracted driving fatalities. According to the GHSA, twenty-seven state highway safety offices have developed such slogans. Figure 4 displays which states have developed campaign messages to prevent distracted driving.

There are several possible explanations for the success of these taglines. Weis and Tschirhart (1994) explain that the first task of a public information campaign is to capture the attention of the right audience and cite an example of a catchy slogan as a means of being successful. The authors also explain that triggering norms and evoking moral obligations to adhere to socially acceptable behavior can work as a means to

³⁶ "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. (February 5, 2018)

³⁷ Perrin, Andrew. "Social Media Usage: 2005-2015." Pew Research Center. <http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015>. (March 28, 2018)

influence behavior.³⁸ Examples of state developed taglines include “DRIVE NOW TEXT LATER” in Rhode Island and “Text Talk Ticket, Hang Up and Drive” in Washington state. Two states (Kentucky and Minnesota) report using the tagline “One Text or Call Could Wreck It All”, which was developed by the federal National Highway Traffic Safety Administration. These taglines exhibit the previously mentioned traits of successful campaigns (being easily memorable and appealing to socially acceptable behavior – responsible driving) as outlined by Weis and Tschirhart (1994). Finally, this type of messaging has been successful in similar campaigns. For example, an analysis of the national *Click It or Ticket* campaign credits some of its success due to slogan recognition and strategic communications.³⁹

Table 4: The Effect of State Public Education Efforts on Cell Phone Related Distracted Driving Fatalities

VARIABLES	(Model 4) Public Education Activities 2010	(Model 5) Public Education Activities 2012	(Model 6) Campaign Message/Tagline
Public Education 2010	-0.72091 (0.55108)		
Social Media 2010	0.29624 (0.45517)		
Public Education 2012		1.15471 (0.94775)	
Social Media 2012		-0.84738* (0.49124)	
Campaign Message/Tagline			-0.55131*** (0.15821)
Constant	-1.17060*** (0.35795)	-2.08402** (0.82462)	-1.26995*** (0.12687)
Observations	51	51	357

Robust standard errors in parentheses

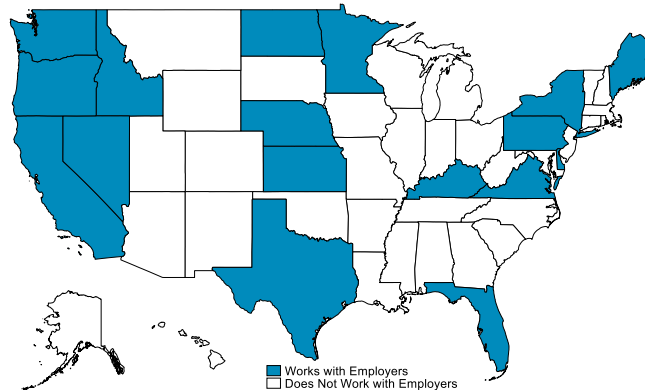
*** p<0.01, ** p<0.05, * p<0.1

³⁸ Weiss, Janet A., and Mary Tschirhart. "Public information campaigns as policy instruments." (1994)

³⁹ Tison, Julie, Allan F. Williams. "Analyzing the first years of the click it or ticket mobilizations - No. DOT HS 811 232." (February 10, 2018)

4.4 Public-Private Partnerships

Figure 5: States Working with Employers to Develop Distracted Driving Policies



Many state highway safety agencies have begun a variety of public-private partnerships as part of their public education campaigns to address distracted driving. Models 7 and 8 measure the effect of such partnerships in 2010 and 2012, respectively. However, the mere existence of these partnerships fails to produce statistically significant results. It is interesting to note that according to the GHSA, there was a 20 percent increase from 2010 to 2012 in the number of states reporting that they have begun to work with other government agencies or private organizations to concentrate on decreasing distracted driving.⁴⁰ There are also two other types of collaboration that are worth examining: state agencies with working employers and research efforts with colleges and universities. The former's presence results in a statistically significant reduction in of .46 fatalities per 100,000 population decrease in cell phone related distracted driving fatalities. Figure 5 displays which states have active partnerships with employers as part of their public education campaigns.

There are several possible explanations as to why the employer partnerships are significantly successful, while the other partnerships are not. First, many state agencies

⁴⁰ "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. (February 5, 2018)

have hired corporate outreach coordinators who are specifically responsible for working with employers on these types of issues.⁴¹ Having agency staff members with specialized skills in this area may account for the significant decrease in cell phone related distracted driving fatalities. A second possible explanation is that several state agencies report working with the state affiliates of the National Safety Council (NSC) to reach employers. The NSC has developed a white paper to help employers with establishing or strengthening a ban on cell phone use while behind the wheel.⁴² Employers have great incentive to thoroughly train their employees because companies may be held accountable for employees who are involved in a cell phone related crash while working.⁴³ In other words, this decrease in fatalities is being heavily influenced by the efforts the NSC working with companies, as opposed to lone state agencies efforts.

Table 5: The Effect of Public-Private Partnerships on Cell Phone Related Distracted Driving Fatalities

	(Model 7)	(Model 8)	(Model 9)
VARIABLES	Other Partnerships 2010	Other Partnerships 2012	Employer Collaboration & University Research
Other Partnerships 2010	-0.67047 (0.47698)		
Other Partnerships 2012		0.18701 (0.47656)	
Employer Collaboration			-0.45776*** (0.14760)
University Research			0.06234 (0.16437)
Constant	-1.13119*** (0.43102)	-1.67215*** (0.40275)	-1.39716*** (0.14839)
Observations	51	51	357

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

⁴¹ "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. (February 5, 2018)

⁴² "Employer Liability and the Case for Comprehensive Cell Phone Policies." National Safety Council. https://www.nsc.org/safety_road/Distracted_Driving/Documents/CorpLiability_wp.pdf. (March 28, 2018)

⁴³ "Understanding the Effects of Distracted Driving and Developing Strategies to Reduce Resulting Deaths and Injuries – A Report to Congress." U.S. National Highway Safety Administration. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/812053-understandingeffectsdistracteddrivingreporttocongress.pdf>. (March 28, 2018)

4.5 Combined Approach

It is important to recognize that many states are utilizing both penalties and public education efforts to combat cell phone related distracted driving. Table 6 displays the results of Model 10 which measures the combined effects of texting while driving ban laws and state public education efforts that incorporate public-private partnerships. Similar to the results of Model 3, having a penalty that is greater than the national average for first time offenders is associated with a statistically significant decrease in fatalities, however, this effect is greater in the combined model. Interestingly, higher penalties for a second offense reach a statistically significant increase in fatalities in the combined model whereas the coefficient on higher penalties for a third or subsequent offense fail to reach this threshold. A possible explanation for different outcomes between the models is that the education campaigns are being effective to the extent that they are preventing multiple offenders and hence, driving down the significance of higher penalties for third or subsequent offenses.

The results of the combined model mirror the results of Models 5 and 6 showing that the use of social media and a campaign tagline is associated with decreases in fatalities. However, the results of this model also convey that university research and not employer collaboration is associated with a decrease in fatalities. These results are opposite of what was discovered in the original regression (Model 9). A possible explanation for this phenomenon may lie in the specifics of the research efforts with colleges and universities. According to the GHSA, at least nine states indicated that they were working with their higher education partners to conduct attitudinal surveys about distracted driving in their

states.⁴⁴ These efforts may be more effective at both raising awareness of distracted driving laws as well providing state agencies with data to better craft their message and target citizens through their campaigns. Whereas private employers working on this issue may not have access to such data.

Table 6: The Effect of Combining Texting While Driving Bans and State Public Education Efforts

VARIABLES	(Model 10)
	Combination of Penalties and Public Education Campaigns
Primary Enforcement	0.86181 (0.78984)
Texting Ban Penalty - First Offense >100	-1.36360*** (0.41243)
Texting Ban Penalty - Second Offense >150	0.93571** (0.39612)
Texting Ban Penalty - Third or Subsequent Offense >200	-0.54635 (0.43262)
Public Education 2012	0.76088 (0.76006)
Social Media 2012	-1.10976*** (0.36279)
Campaign Tagline	-0.71269** (0.32608)
Other Partnerships 2012	0.43197 (0.41927)
Employer Collaboration	-0.10805 (0.33307)
University Research	-0.68706* (0.41088)
Constant	-1.71999* (1.01150)
Observations	43

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

5.1 Summary of Key Findings

This article provides a statistical analysis of the effectiveness of state policies to prevent cell phone related distracted driving fatalities. More specifically, using Poisson regression models, penalty severity for violating a texting while driving law and public education efforts by state governments were analyzed. The results of the individual policy models suggest that the most important public policy variables for preventing

⁴⁴ "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. (February 5, 2018)

distracted driving fatalities are (in descending order): using social media as part of a public education campaign, having a penalty for a first violation that is greater than \$100, a state using a campaign tagline as part of their public education efforts, having a penalty for a third or subsequent violation that is greater than \$200 and finally, working with employers to develop distracted driving policies. A model which takes into account both penalties and public education campaigns indicates very similar results, with the exception of university research partnerships being significant as opposed to employer collaborations and harsher penalties for third or subsequent violations failing to provide significant declines in fatalities.

5.2 Policy Implications

The results of this paper can inform policymakers working in two arenas. The first group of policymakers that can benefit from these findings is state legislators that are interested in preventing cell phone related distracted driving fatalities. Since penalty amounts are written into the statutes, a new state law would be required to be passed to increase these fines. As previously mentioned, a state having a penalty greater than the national averages of \$100 for a first-time violation and \$200 for a third/subsequent violation for texting while driving is associated with a significant decrease in fatalities. An analysis of the data shows that the majority of states (27 states plus the District of Columbia) have higher penalties for first-time violators. However, only 18 states have third/subsequent violation penalties that are greater than the national average of \$200. Lawmakers in states with lower penalty amounts may benefit from considering legislation to increase penalty amounts as a means to decrease fatalities.

The second group of policymakers that can benefit from utilizing these results are leaders in the state highway safety offices. Models 5 and 6 show that the use of social media and utilizing a distracted driving campaign message or tagline is associated with a statistically significant decline in cell phone related fatalities. In an era of ever shrinking budgets, these are low cost measures that can be implemented in a relatively cheap fashion. For instance, the federal NHTSA has developed Distraction.gov and TrafficSafetyMarketing.gov, which contain an abundance of free information and materials that state agencies can use to better educate the public on the dangers of this behavior.⁴⁵ Utilizing these federal initiatives that are already fully developed and sharing these materials on social media would be a low-cost way for state agencies to combat cell phone related distracted driving.

5.3 Limitations of this Research

This analysis possesses several limitations. First, it does not take into account rural and urban speed limits and only measures vehicular fatality rates (as opposed to simply vehicular crashes). According to Grabowski and Morrissey (2001), higher maximum speed limits are associated with higher fatality rates.⁴⁶ Therefore, the cell phone related distracted driving fatality rate may be higher in a state such as California, where the maximum speed limit on most highways is 65 miles per hour and drivers may

⁴⁵ U.S. Department of Transportation – National Highway Safety Administration. “Understanding the Effects of Distracted Driving and Developing Strategies to Reduce Resulting Deaths and Injuries – A Report to Congress.” (2013)

⁴⁶ Grabowski, David C., and Michael A. Morrissey. "The Effect of State regulations on Motor Vehicle Fatalities for Younger and Older Drivers: A Review and Analysis." *The Milbank Quarterly* 79, no. 4 (2001): 517-545.

drive 70 mph where posted,⁴⁷ than in the District of Columbia, where the maximum lawful speed is 25 mph on almost all streets and highways.⁴⁸ Likewise, a second limitation of this research is the absence of a control for driver densities. While previous research has shown that the fatal crash incidence density rate can sometimes be twice as high in rural areas than compared to urban areas (Zerling, et al. 2005)⁴⁹, it is unclear what effect density plays in relation to policy efforts to prevent distracted driving. A third limitation is the absence of survey data to better understand the reach of public education campaigns. Finally, while the results of this paper show that public education campaigns may be effective in reducing the number of cell phone related distracted driving fatalities, state agencies are not the only entities broadcasting such messages. This paper does not account for the previously mentioned federal campaigns nor entirely private sector established campaigns.

5.4 Areas for Future Research

The results of this article suggest that public education campaigns, particularly those that utilize social media and a slogan can be effective at reducing distracted driving fatalities, it is unclear as to what type of messaging is most effective: those that emphasize penalties for violating the law or those that amplify warnings regarding personal safety? Future work in analyzing this policy area should place an emphasis on understanding which type of messages are most impactful to drivers. Finally, any future

⁴⁷ "California Driver Handbook - Laws and Rules of the Road." California Department of Motor Vehicles. https://www.dmv.ca.gov/portal/dmv/?1dmy&urile=wcm:path:/dmv_content_en/dmv/pubs/hdbk/right_of_way. (March 28, 2018)

⁴⁸ "Speeding Laws, Fines and Safety Tips." Metropolitan Police Department of the District of Columbia. <https://mpdc.dc.gov/page/speeding-laws-fines-and-safety-tips>. (March 28, 2018)

⁴⁹ Zerling, C., C. Peek-Asa, P. S. Whitten, Sung-Won Choi, N. L. Sprince, and Michael P. Jones. "Fatal Motor Vehicle Crashes in Rural and Urban Areas: Decomposing Rates into Contributing Factors." *Injury Prevention* 11, no. 1 (2005): 24-28.

research should account for the rollout of technologies which seek to prevent cell phone use by those operating a motor vehicle. For example, with iOS 11, an iPhone senses when an individual might be driving and prevent notifications until they have stopped. Additional research in this area should be designed to account for these types of technologies to better isolate the effectiveness of public policies to address cell phone distracted driving fatalities.

6. References

- "2013 Distracted Driving: Survey of the States." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2016-12/2013_distraction.pdf. (February 5, 2018)
- Abouk, Rahi, and Scott Adams. "Texting Bans and Fatal Accidents on Roadways: Do They Work? Or Do Drivers Just React to Announcements of Bans?" *American Economic Journal: Applied Economics* 5, no. 2 (2013): 179-99.
- "California Driver Handbook - Laws and Rules of the Road." California Department of Motor Vehicles. https://www.dmv.ca.gov/portal/dmv/?1dmy&urile=wcm:path:/dmv_content_en/dmv/publications/hdbk/right_of_way. (March 28, 2018)
- "Census Regions and Divisions of the United States." U.S. Census Bureau. https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf. (March 28, 2018)
- Centers for Disease Control and Prevention. "Mobile Device Use While Driving – United States and Seven European Countries." *Morbidity and Mortality Weekly Report*. (2011)
- Chase, JD Catherine. "US State and Federal Laws Targeting Distracted Driving." *Annals of Advances in Automotive Medicine* 58 (2014): 84.
- Cheng, Cheng. "The Effect of Cell Phone Bans on Driver Behavior: Accidents and Casualties." *College Station, TX: Department of Economics, Texas A&M University* (2012).
- "Distracted Driving." National Highway Traffic Safety Administration. <https://www.nhtsa.gov/risky-driving/distracted-driving>. (February 7, 2018)
- "Employer Liability and the Case for Comprehensive Cell Phone Policies." National Safety Council. https://www.nsc.org/safety_road/Distracted_Driving/Documents/CorpLiability_wp.pdf. (March 28, 2018)
- Grabowski, David C., and Michael A. Morrissey. "The Effect of State regulations on Motor Vehicle Fatalities for Younger and Older Drivers: A Review and Analysis." *The Milbank Quarterly* 79, no. 4 (2001): 517-545.
- Harding, Cody J. "The Failure of State Texting-While-Driving Laws." *Pittsburgh Journal of Technology Law & Policy* 13 (2012): i

Ibrahim, Jennifer K., Evan D. Anderson, Scott C. Burris, and Alexander C. Wagenaar. "State Laws Restricting Driver Use of Mobile Communications Devices: Distracted-Driving Provisions, 1992–2010." *American Journal of Preventive Medicine* 40, no. 6 (2011): 659-665.

Insurance Institute for Highway Safety. "Texting Laws and Collision Claim Frequencies." *Highway Loss Data Institute Bulletin* Vol. 27, No. 11 (2010)

Jacobson, Peter D., and Lawrence O. Gostin. "Reducing Distracted Driving: Regulation and Education to Avert Traffic Injuries and Fatalities." *Journal of the American Medical Association* 303, no. 14 (2010): 1419-1420.

Jacobson, Sheldon H., Douglas M. King, Kevin C. Ryan, and Matthew J. Robbins. "Assessing the Long Term Benefit of Banning the Use of Hand-Held Wireless Devices While Driving." *Transportation Research Part A: Policy and Practice* 46, no. 10 (2012): 1586-1593.

Kim, Karl, and Eric Yamashita. "Click It or Ticket: Boosting Seat Belt Use in Hawaii." *Highway Safety, Traffic Law Enforcement*. (2003)

Kwon, Oh Hoon, Yoonjin Yoon, and Kitae Jang. "Evaluating the Effectiveness of the Law Banning Handheld Cellphone Use While Driving." *Safety Science* 70 (2014): 50-57.

Lim, Siew Hoon, and Junwook Chi. "Are Cell Phone Laws in the US Effective in Reducing Fatal Crashes Involving Young Drivers?" *Transport Policy* 27 (2013): 158-163.

McCartt, Anne T., Laurie A. Hellinga, and Keli A. Bratiman. "Cell Phones and Driving: Review of Research." *Traffic Injury Prevention* 7, no. 2 (2006): 89-106.

McCartt, Anne T., Laurie A. Hellinga, Laura M. Strouse, and Charles M. Farmer. "Long-Term Effects of Handheld Cell Phone laws on Driver Handheld Cell Phone Use." *Traffic Injury Prevention* 11, no. 2 (2010): 133-141.

McCartt, Anne T., David G. Kidd, and Eric R. Teoh. "Driver cellphone and texting bans in the United States: evidence of effectiveness." *Annals of Advances in Automotive Medicine* 58 (2014): 99.

"Opening Statement of Chairman Greg Walden Subcommittee on Digital Commerce and Consumer Protection Hearing on "Oversight of the National Highway Traffic Safety Administration." U.S. House Energy and Commerce Committee.
<http://docs.house.gov/meetings/IF/IF17/20180214/106854/HHRG-115-IF17-MState-W000791-20180214.pdf>. (February 8, 2018)

“Oregon House Bill 2597 – Distracted Driving Fact Sheet.” Oregon Department of Transportation.

http://www.oregon.gov/odot/safety/documents/hb2597_summary_for_public.pdf.

(February 10, 2018)

Perrin, Andrew. “Social Media Usage: 2005-2015.” Pew Research Center.

<http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015>. (March 28, 2018)

Raine, Lee. “Cell Phone Ownership Hits 91% of Adults.” Pew Research Center.

<http://www.pewresearch.org/fact-tank/2013/06/06/cell-phone-ownership-hits-91-of-adults/>. (February 7, 2018)

Rocco, Leandro, and Breno Sampaio. "Are Handheld Cell Phone and Texting Bans Really Effective in Reducing Fatalities?" *Empirical Economics* 51, no. 2 (2016): 853-876.

Sartzetakis, Eftichios S., Anastasios Xepapadeas, and Emmanuel Petrakis. "The Role of Information Provision as a Policy Instrument to Supplement Environmental Taxes." *Environmental and Resource Economics* 52, no. 3 (2012): 347-368.

Shropshire, Corilyn. “Americans prefer texting to talking, report says.” *Chicago Tribune*.

<http://www.chicagotribune.com/business/ct-americans-texting-00327-biz-20150326-story.html>. (March 5, 2018)

“Speeding Laws, Fines and Safety Tips.” Metropolitan Police Department of the District of Columbia. <https://mpdc.dc.gov/page/speeding-laws-fines-and-safety-tips>. (March 28, 2018)

“State Laws on Distracted Driving - Ban on Hand-Held Devices and Texting While Driving.” U.S. Department of Transportation. <https://www.bts.gov/content/state-laws-distracted-driving-ban-hand-held-devices-and-texting-while-driving>. (February 10, 2018)

Tison, Julie, Allan F. Williams. “Analyzing the first years of the click it or ticket mobilizations - No. DOT HS 811 232.” U.S. National Highway Traffic Safety Administration <https://www.ems.gov/pdf/811232.pdf>. (February 10, 2018)

“Understanding the Effects of Distracted Driving and Developing Strategies to Reduce Resulting Deaths and Injuries – A Report to Congress.” U.S. National Highway Safety Administration. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/812053-understandingeffectsdistracteddrivingreporttocongress.pdf>. (March 28, 2018)

"Vehicle Code Section 23124." California Legislative Information.

https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=VEH§ionNum=23124. (February 10, 2018)

- Weiss, Janet A., and Mary Tschirhart. "Public Information Campaigns as Policy Instruments." *Journal of Policy Analysis and Management* 13, no. 1 (1994): 82-119.
- Wilson, Fernando A., and Jim P. Stimpson. "Trends in Fatalities From Distracted Driving in the United States, 1999 to 2008." *American Journal of Public Health* 100, no. 11 (2010): 2213-2219.
- Zwerling, C., C. Peek-Asa, P. S. Whitten, Sung-Won Choi, N. L. Sprince, and Michael P. Jones. "Fatal Motor Vehicle Crashes in Rural and Urban Areas: Decomposing Rates into Contributing Factors." *Injury Prevention* 11, no. 1 (2005): 24-28.

7. Curriculum Vita

Leonard Bellisario is a native of Cleveland, Ohio. He holds a Bachelor of Arts in Political Science with a Certificate in Applied Politics and a minor in Business Administration from the University of Akron. Leonard has nearly a decade of experience working in the policy, political and nonprofit sectors. He served as a legislative intern in the U.S. Senate and has worked with several nonprofit organizations including the William J. Clinton Foundation and the Cleveland Foodbank. During the 2012 presidential election, he was a Field Organizer for President Barack Obama's reelection campaign in Northeast Ohio. Since 2013, Leonard has worked in the government affairs department of the American Cleaning Institute, the trade association representing the U.S. cleaning products industry.